

LISTING OF THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Previously presented) A vector-detecting apparatus that detects an in-phase component and a quadrature-phase component of a pre-determined frequency signal, said apparatus comprising:

a first filter; and

a second filter whose impulse response is orthogonal to said first filter,

wherein an output of said first filter is regarded as the in-phase component of said pre-determined frequency signal, and output of said second filter is regarded as the quadrature-phase component of said pre-determined frequency signal,

wherein an impulse response of said first filter is weighted by a sine function of the frequency of the pre-determined frequency signal and an impulse response of said second filter is weighted by a cosine function of the frequency of the pre-determined frequency signal,

wherein said first filter is a single filter that has an impulse response weighted by a sine function of the frequency of the pre-determined frequency signal and said second filter is a single filter that has an impulse response weighted by a cosine function of the frequency of the pre-determined frequency signal, and

wherein said first filter and said second filter are digital filters.

2. (Canceled)

3. (Currently amended) A vector-detecting apparatus that detects an in-phase component and a quadrature-phase component of a pre-determined frequency signal, said apparatus comprising:

a ~~mixer frequency converter~~ for converting said pre-determined frequency signal to a signal under test;

a first filter; and

a second filter,

wherein said first and second filters filter an output signal of said ~~mixer frequency converter~~ and whose impulse responses are orthogonal to each other,

wherein an output of said first filter is regarded as the in-phase component of said signal under test, and an output of said second filter is regarded as the quadrature-phase component of said signal under test,

wherein an impulse response of said first filter is weighted by a sine function of the frequency of said signal under test after frequency conversion by said ~~mixer frequency converter~~, and an impulse response of said second filter is weighted by a cosine function of the frequency of the signal under test after frequency conversion by the ~~mixer frequency converter~~,

wherein said first filter and said second filter are digital filters,

wherein a ratio of the frequency of said pre-determined frequency signal and said signal under test is an integer of 2 or higher, and

wherein a ratio of the frequency of a local signal inputted into said ~~mixer frequency converter~~ and said signal under test is an integer of 3 or higher.

4. (Canceled)

5. (Canceled)

6. (Previously presented) An impedance measuring apparatus comprising a vector-detecting apparatus, wherein said vector-detecting apparatus comprises:

a first filter and a second filter whose impulse responses are orthogonal to each other;

wherein an output of said first filter is regarded as an in-phase component of a pre-determined frequency signal, and an output of said second filter is regarded as a quadrature-phase component of said pre-determined frequency signal,

wherein the impulse response of said first filter is weighted by a sine function of the frequency of the pre-determined frequency signal and the impulse response of said second filter is weighted by a cosine function of the frequency of the pre-determined frequency signal,

wherein said first filter is a single filter that has an impulse response weighted by a sine function of the frequency of the pre-determined frequency signal and said second filter is a single filter that has an impulse response weighted by a cosine function of the frequency of the pre-

determined frequency signal, and

wherein said first filter and said second filter are digital filters.

7. (Canceled)

8. (Currently amended) An impedance measuring apparatus that measures an in-phase component and a quadrature-phase component of a pre-determined frequency signal, said apparatus comprising:

a ~~mixer~~frequency converter;

a first filter; and

a second filter, wherein said first and second filters are capable of filtering an output signal of said ~~mixer~~ frequency converter and whose impulse responses are orthogonal to each other,

wherein an output of said first filter is regarded as the in-phase component of said pre-determined frequency signal, and an output of said second filter is regarded as the quadrature-phase component of said pre-determined frequency signal,

wherein the impulse response of said first filter is weighted by a sine function of the frequency of the pre-determined frequency signal after frequency conversion by said ~~mixer~~ frequency converter and the impulse response of said second filter is weighted by a cosine function of the frequency of the pre-determined frequency signal after frequency conversion by said ~~mixer~~ frequency converter,

wherein said first filter and said second filter are digital filters,

wherein a ratio of the frequency of said pre-determined frequency signal and said signal under test is an integer of 2 or higher, and

wherein a ratio of the frequency of a local signal inputted into said ~~mixer~~ frequency converter and said signal under test is an integer of 3 or higher.

9. (Canceled)

10. (Canceled)